

Remarks

Reconsideration of the application and allowance of all pending claims are respectfully requested. Claims 1-15, 24-38, and 47-54 remain pending.

By this amendment, independent claims 1, 24, 47, 48 & 50 are amended to address the claim objections stated in the Office Action. Specifically, the term “that may be” is deleted from these claims in order to more positively recite that the routing is based on data content of the message irrespective of any destination information within the message. Based upon these amendments, withdrawal of the claims objection is respectfully requested.

Claims 1-15, 24-38, and 47-54 were rejected in the Office Action under 35 U.S.C. 103(a) as being unpatentable under Bracho et al. (U.S. Patent No. 6,021,443; hereinafter “Bracho”) in view of Marco (U.S. Patent No. 6,266,337 B1). In addition, claims 1-15, 24-38, and 47-54 were rejected under 35 U.S.C. 103(a) as being unpatentable over Chandra et al. (U.S. Patent No. 6,091,724; hereinafter “Chandra”) in view of Marco. Each of these rejections is respectfully, but most strenuously, traversed and reconsideration thereof is respectfully requested.

Independent claims 1, 24 & 47-50 each recite a technique for routing messages within a network environment. The technique includes, in part, receiving a message into the network and routing the message to multiple clients of the network. The routing is accomplished based on data content of the message irrespective of any destination information within the message. Further, the routing is resilient to router or link failure within the network and is accomplished without loss of the message. Based on these characterizations, applicants respectfully submit that the independent claims, as well as the dependent claims which depend therefrom, patentably distinguish over the teachings and suggestions of the applied patents.

Bracho describes systems and methods for routing events amongst publishers and subscribers of a computer network. A plurality of “publisher” entities publish information and a plurality of “subscribers” entities request and use the information. The publishers and

subscribers are connected to each other through a network. The network is a “store and forward network” whose routing is “content based.” The system receives a published event from a publisher and routes the event to all appropriate subscribers.

Chandra describes routing of messages with a network using the data content of the message to determine on which links out of a router a message is to be forwarded. The router does not need any destination information from the message, and thus, the message need not include the destination information. Instead, the router uses an annotated search data structure to determine which links correspond to consumers interested in receiving the message. The message is sent over only those links.

Without acquiescing to the characterizations of Bracho and Chandra in the Office Action at issue, applicants note that the Office Action admits that Bracho and Chandra are both silent as to disclosing routing of messages to multiple clients of a network, as recited by applicants, wherein the routing is resilient to router or link failure within the network without loss of the message. For an alleged teaching of this concept, the Office Action relies upon Marco, and in particular, column 2, lines 3-7 and column 3, lines 15-25, as well as lines 47-58. Based upon these teachings of Marco, the Office Action rejects all pending claims. Reconsideration of these characterizations of Marco, and withdrawal of the as obvious rejections are respectfully requested.

For convenience, the cited lines of Marco are repeated below:

When a retransmission message is received at the other end of the path, the actual packet (which was stored in a data memory during the prior transmission) is retrieved from the data memory and routed to the final destination in the usual manner. (Column 2, lines 3-7 of Marco).

In accordance with one embodiment of the invention, retransmission eliminators 36A and 36B reduce the traffic associated with the retransmission of packets over the hop. The first time a packet is sent over the hop, the packet is stored in a cache 38 and 40 at each end of the hop. When the router 30 sends a packet over the hop, the retransmission eliminator 36A on that end of the hop compares the packet with the packets stored in the cache 38. When there is a match (i.e., when the packet is a retransmitted packet), the retransmission eliminator 36A sends a special retransmission

packet 42 over the hop instead of the actual packet. The retransmission packet 42 includes information that uniquely identifies the packet. (Column 3, lines 15-25 of Marco).

Given the above scenario, it is more likely that packets will be “lost” on the local network than the IP hop. When a packet is “lost” the packet source (e.g., host computer 24) attempts to retransmit the packet over the expensive long distance link (i.e., the hop). The retransmission eliminator 36A, however, intercepts the packet and instead only sends a relatively small transmission packet 42 over the expensive link. (Column 3, lines 47-58 of Marco).

In relying upon the above-noted recitations of Marco, applicants respectfully submit that the Office Action fails to state a prima facie case of obviousness against the pending claims based either on Bracho and Marco or Chandra and Marco.

As noted from the above citations, Marco describes a packet retransmission eliminator which is installed on opposite ends of a hop within a path in a network. Each original packet sent over the path is cached on the transmitting and the receiving ends of the path. Retransmitted packets that are to be sent over the path are intercepted and replaced with a substitute transmission packet which is presumably much shorter in length). In response to a received retransmission packet, the receiving end retransmits the original packet using the corresponding packet that was previously stored in the cache. As clearly stated in the patent, Marco is directed to enhancing performance by reducing overhead associated with packet retransmission in a packet-based network (see column 1, lines 4-7).

With respect to the above-stated obviousness rejections, a careful reading of Marco fails to uncover any teaching, suggestion or implication of a technique for routing a message to multiple clients in a network that is resilient to router or link failure within a network without loss of the message, let alone such a routing technique which is based on data content of the message irrespective of any destination information within the message. There is simply no discussion in Marco of router or link failure per se, nor of a resilient routing technique for a network which routes a message without loss of the message, notwithstanding router or link failure.

Again, a careful reading of Marco fails to uncover any teaching, suggestion or implication that there is a router or link failure within the network. Rather, the patent addresses an environment wherein packet retransmission is desired. As described at the above-repeated column 3, lines 48-54, Marco indicates that lost packets in a network need to be retransmitted “due to loss of packets on a local network”. This loss of packets could be the result of corruption of a message, or a higher level protocol which requests retransmission of a message periodically. There is simply no implication in Marco as to why retransmission occurs, nor is it necessarily inherent in Marco that retransmission was the result of a router or link failure. In view of this, applicants respectfully, but most strenuously, traverse the characterization of the above-cited lines of Marco as being relevant in applicants routing technique which is resilient to router or link failure. In view of this mischaracterization of the teachings of Marco, applicants respectfully submit that upon a case of obviousness it is not stated in the Office Action based upon Bracho and Marco or Chandra and Marco.

Further, applicants respectfully submit that there is no teaching, suggestion or implication in Marco of a routing technique which is resilient to router or link failure within a network without loss of the message. Marco explicitly teaches that the functional element of his retransmission eliminator includes a “cache” (see FIG. 1, reference 38 & 40, as well as column 2, line 22, column 3, line 18, etc. of Marco). In the art, the term “cache” is well understood and widely used to refer to a “soft copy” of a state. That is, a cache is a copy of data other than a “master copy” of the state, that may or may not be present, but when present may speed up performance of some function.

With respect to the implementation in Marco, it is apparent that Marco is using the term “cache” as the term would imply, that is, that data does not persist and that messages can be flushed out either due to space limitations or due to time expiration (see column 5, lines 9-21 of Marco). Therefore, there is no guarantee in Marco that a particular message will be retained for a period of time within the cache to guarantee message delivery notwithstanding router or link failure.

Because the mechanism described by Marco is incapable of providing applicants' recited routing resiliency without loss of a message notwithstanding router or link failure, applicants respectfully submit that their claimed invention would not have been obvious based thereon in combination with either Bracho or Chandra.

To summarize, there is no discussion in Marco of router or link failure, nor is there any discussion of how or when to redeliver a message due to a router or link failure. Still further, there is no discussion in Marco of how to deliver a message to multiple clients of a network without loss of the message notwithstanding router or link failure within the network. There is simply no teaching of how not to lose messages within a network notwithstanding failure of a router or a link. Marco does not teach any algorithm, protocol, or other mechanism to recover from a router or link failure. Marco does not disclose how to detect when to retransmit messages, nor does he teach any mechanism by which the content of such messages could be retrieved. Still further, the stated purpose of Marco is to provide a more efficient retransmission mechanism. Nothing in Marco discusses routing resiliency without loss of a message notwithstanding failure of a link or router in the network. For all these reasons, applicants respectfully request reconsideration and withdrawal as the obviousness rejection to the pending claims based upon the combination of Bracho and Marco, as well as Chandra and Marco.

The dependent claims are believed allowable for the same reasons as the independent claims, as well as for their own additional characterizations.

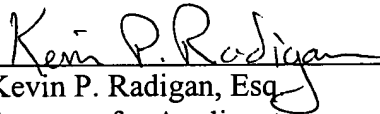
For example, neither Bracho, Marco or Chandra teach, suggest or imply all or nothing routing to multiple clients such as recited by applicants in claims 2 & 26. Further, Applicants recite logging a message to at least one logging node within a network before delivering the message to multiple clients in the network. This logging includes storing the message to persistent storage. Neither Bracho, Marco or Chandra teach or suggest storing a message to persistent storage prior to delivery thereof. Note again that the cache described by Marco is volatile memory and does not qualify as persistent storage as the term is understood in the art. Claims 51 & 53 further characterize the routing of the message being specifically resilient to

router failure within a network without loss of the message. There is no suggestion or implication that the message caching in Marco would survive a router failure. Claims 52 & 54 further recite that the routing of the message to the multiple clients is resilient to multiple concurrent router or link failures within the network without loss of the message. A careful reading of Marco fails to uncover any suggestion or implication that the point-to-point retransmission technique therein could withstand multiple router or link failures.

For all of the above reasons, applicants respectfully submit that the claims presented herewith patentably distinguish over the applied art. In view of this, applicants request reconsideration and withdrawal of all rejections pending in the application.

If the Examiner wishes to discuss this application further, the Examiner is invited to telephone applicants' below-listed representative. The application is believed to be in condition for allowance and such action is respectfully requested.

Respectfully submitted,



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